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## Economic Commission for Europe

### Inland Transport Committee

### World Forum for Harmonization of Vehicle Regulations

#### 193rd session

Geneva, 25–28 June 2024

Item 4.8.5 of the provisional agenda

#### 1958 Agreement:

Consideration of draft amendments to existing

UN Regulations submitted by GRVA

## **Proposal for Supplement 5 to the 01 series of amendments to UN Regulation No. 13-H (Braking of passenger cars)**

### **Submitted by the Working Party on Automated/Autonomous and Connected Vehicles\***

The text reproduced below was adopted by the Working Party on Automated/Autonomous and Connected Vehicles (GRVA) at its eighteenth session (ECE/TRANS/WP.29/GRVA/18, para. 43). It is based on ECE/TRANS/WP.29/GRVA/2024/9, as amended by informal document GRVA-18-31. It is submitted to the World Forum for Harmonization of Vehicle Regulations (WP.29) and to the Administrative Committee (AC.1) for consideration at their June 2024 sessions.

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\* In accordance with the programme of work of the Inland Transport Committee for 2024 as outlined in proposed programme budget for 2024 (A/78/6 (Sect. 20), table 20.5), the World Forum will develop, harmonize and update UN Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.

*Insert a new paragraph 1.2.4.:*

- "1.1. This Regulation applies to the braking of vehicles of categories M<sub>1</sub> and N<sub>1</sub>.<sup>1</sup>
- 1.2. This Regulation does not cover:
  - 1.2.1. Vehicles with a design speed not exceeding 25 km/h;
  - 1.2.2. Vehicles fitted for invalid drivers;
  - 1.2.3. The approval of the ESC and BAS systems of the vehicle.
  - 1.2.4. Vehicles which are not equipped with manual braking controls intended for use during normal operation."

*Insert new paragraphs 2.25. and 2.25.1.:*

- "2.25. 'Automated Driving System (ADS)' means the vehicle hardware and software that are collectively capable of performing the entire Dynamic Driving Task (DDT) on a sustained basis.
- 2.25.1. 'Dynamic Driving Task (DDT)' means the real-time operational and tactical functions required to operate the vehicle."

*Paragraph 5.2.9., amend to read:*

- "5.2.9. Malfunctions of the electric control transmission shall not apply the brakes contrary to the intentions of the driver or ADS."

*Paragraph 5.2.10., amend to read:*

- "5.2.10. The service, secondary and parking braking systems shall act on braking surfaces connected to the wheels through components of adequate strength.

Where braking torque for a particular axle or axles is provided by both a friction braking system and an electrical regenerative braking system of category B, disconnection of the latter source is permitted, providing that the friction braking source remains permanently connected and able to provide the compensation referred to in paragraph 5.2.7.1. above.

However, in the case of short disconnection transients, incomplete compensation is accepted, but within 1s, this compensation shall have attained at least 75 per cent of its final value.

Nevertheless, in all cases, the permanently connected friction braking source shall ensure that both the service and secondary braking systems continue to operate with the prescribed degree of effectiveness.

Disconnection of the braking surfaces of the parking braking system shall be permitted only on condition that the disconnection is controlled by the driver from his driving seat or from a remote control device, or by an ADS, by a system incapable of being brought into action by a leak.

The remote control device mentioned above shall be part of a system fulfilling the technical requirements of an ACSF of Category A as specified in the 02 series of amendments to UN Regulation No. 79 or later series of amendments."

*Paragraph 5.2.18.1.1., amend to read:*

- "5.2.18.1.1. The electric regenerative braking shall only be activated by reduction of the acceleration demand and/or the gear neutral position."

*Paragraph 5.2.18.3., amend to read:*

- "5.2.18.3. For vehicles fitted with an electric regenerative braking system of either category, all the relevant prescriptions shall apply except paragraph 5.2.18.1.1. above. In this case, the electric regenerative braking may be actuated by reduction of the acceleration demand and/or the gear neutral position. Additionally, the action on the service braking control shall not reduce the above braking effect generated by the reduction of the acceleration demand."

Paragraph 5.2.19.2., amend to read:

"5.2.19.2. In the case of an electrical failure in the control or a break in the wiring within the electric control transmission between the control and the ECU directly connected with it, excluding the energy supply, it shall remain possible to apply the parking braking system from the driver's seat and thereby be capable of holding the laden vehicle stationary on an 8 per cent up or down gradient. Alternatively, in this case, an automatic actuation of the parking brake is allowed when the vehicle is stationary, provided that the above performance is achieved and, once applied, the parking brake remains engaged independently of the status of the ignition (start) switch. In this alternative, the parking brake shall be automatically released as soon as the driver or ADS starts to set the vehicle in motion again. The engine/manual transmission or the automatic transmission (park position) may be used to achieve or assist in achieving the above performance."

Paragraph 5.2.22.2., amend to read (footnote 6 unchanged):

"5.2.22.2. Requirements for vehicles equipped with an Automated Driving System, automatically commanded braking and/or regenerative braking which produce a retarding force (e.g. upon release of the accelerator control)<sup>6</sup>.

<i>Deceleration demanded by an Automated Driving System, automatically commanded braking and/or regenerative braking</i>	
$\leq 1.3 \text{ m/s}^2$	$> 1.3 \text{ m/s}^2$
May generate the signal	Shall generate the signal

Once generated, the signal shall be kept..."

Insert new paragraphs 5.3., 5.3.1., 5.3.2., 5.3.2.1., 5.3.3.:

- "5.3. Special Provisions for vehicles equipped with an Automated Driving System
- The braking equipment of any vehicle equipped with an Automated Driving System, other than Automated Lane Keeping Systems as defined in UN Regulation No. 157, shall fulfil the following requirements.
- 5.3.1. An ADS may control the vehicle's braking equipment providing that the ADS is designed to comply with relevant national and/or international technical regulations and relevant national legislation governing operation, and providing that its activation is restricted by technical means to the jurisdiction(s) where these apply. Compliance with this requirement shall be declared by the manufacturer at the time of the application for approval.
- 5.3.2. Compliance with the applicable performance requirements of this UN Regulation whilst the ADS is active shall be demonstrated in accordance with Annex 8.
- 5.3.2.1. The transmission links between the ADS and the braking equipment (excluding the ADS itself), are subject to the requirements of Annex 8.
- 5.3.3. Whilst the ADS is active, detected faults as specified in this UN Regulation shall be transmitted to the ADS. "

Annex 1, insert new item 14.1., to read:

"14.1. Vehicle is equipped with an ADS: yes/no"